

(Reaffirmed 2001)

Indian Standard

(Reaffirmed 2012)



SPECIFICATION FOR  
PLIERS, PIN-ROUGHENING AND BENDING, DENTAL  
(First Revision)

**1. Scope** — This standard specifies material, dimensions and other requirements for pin-roughening and bending pliers used in dentistry.

**2. Material** — Stainless steel conforming to designation 30Cr13 of IS : 6603-1972 'Specification for stainless steel bars and flats'.

**3. Shape and Dimensions** — As shown in Fig. 1.

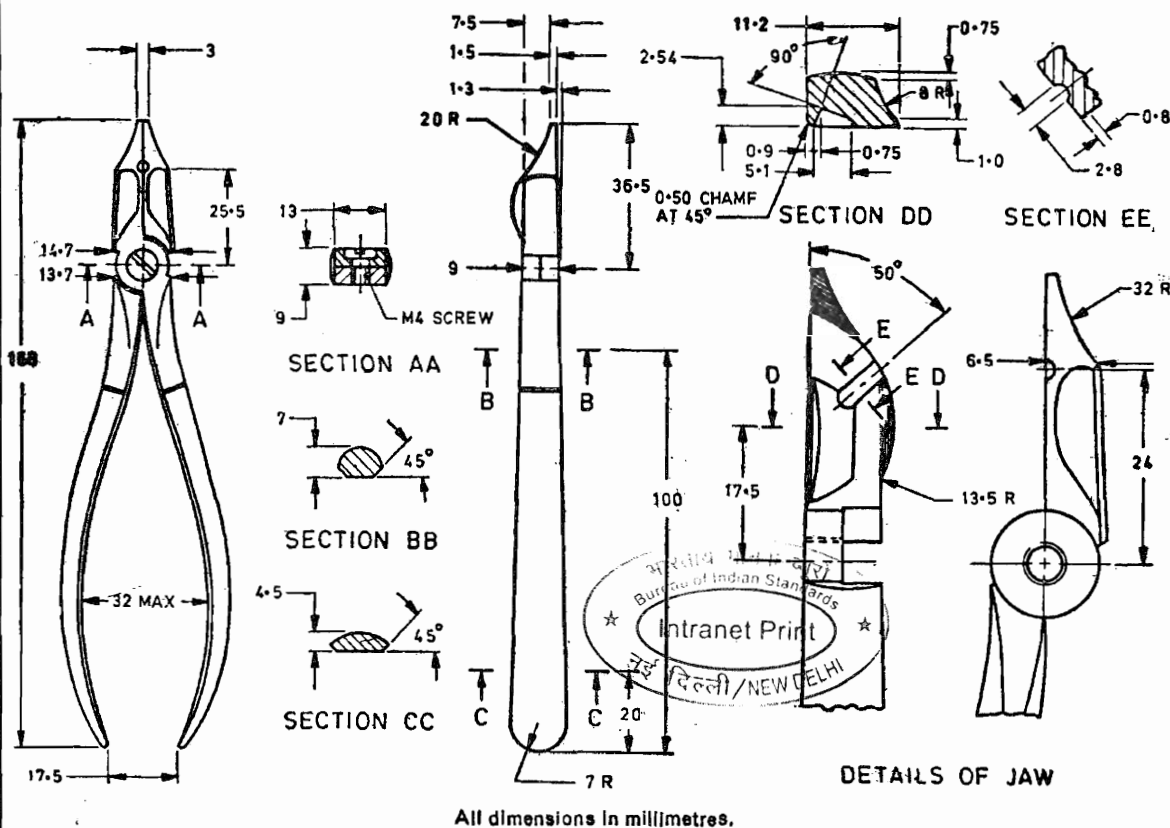


FIG. 1 PLIERS, PIN-ROUGHENING AND BENDING, DENTAL

**3.1 Tolerances on linear dimensions shall be as given below:**

- a)  $\pm 0.05$  mm on dimensions up to 2.0 mm,
- b)  $\pm 0.1$  mm on dimensions above 2.0 mm and up to 5.0 mm,
- c)  $\pm 0.2$  mm on dimensions above 5.0 mm and up to 20.0 mm,
- d)  $\pm 0.5$  mm on dimensions above 20.0 mm and up to 50.0 mm,
- e)  $\pm 1.0$  mm on dimensions above 50.0 mm and up to 100.0 mm, and
- f)  $\pm 2.0$  mm on dimensions above 100.0 mm.

**3.2 Tolerance on angles shall be  $\pm 2^\circ$ .**

**4. Heat Treatment** — The pliers shall be uniformly hardened and tempered to a hardness of 500 to 600 HV, when tested in accordance with IS : 1501 (Part 1)-1984 'Method for Vickers hardness test for metallic materials: Part 1 HV 5 to 100 (second revision)'.

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Gr 2

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## 5. Workmanship

5.1 The two halves of the pliers shall move freely about the joint without any play and shall open fully. The instrument shall be balanced, the movement shall be even and the jaws shall register accurately.

5.2 All the edges shall be even, free from pits, and except for the cutting edge, rounded and nowhere sharp.

5.3 The serrations shall be in accordance with Section 1 of IS : 3642-1978 'General requirements for surgical instruments (first revision)'.

5.4 The screw joint shall be in accordance with the relevant requirements of 6 of IS : 3642-1978.

## 6. Surface Condition

6.1 *General* — All surfaces shall be free from pores, crevices and grinding marks. The instruments shall be supplied free from residual scale, acid, grease and grinding and polishing materials. Compliance with these requirements shall be checked by inspection using normal vision (corrected, if necessary).

6.2 *Surface Finish* — The surface finish shall be one of, or a combination of, the following :

- a) Mirror polished;
- b) Reflection-reducing, for example satin finish, matt black finish; and
- c) An applied surface coating, for example for insulation purposes.

**Note** — The satin finish should be effected by an appropriate procedure, such as grinding, brushing, electropolishing and in addition, satin finishing (glass beading or satin brushing). The finish should be uniform and smooth and it should reduce glare.

Instruments of mirror finish should be adequately ground to remove all surface imperfections and polished to remove grinding marks, resulting in a mirror finish. The mirror finish should be effected by an appropriate procedure, such as polishing, brushing, electropolishing, and mirror buffing.

6.3 *Passivation and Final Treatment* — The instruments shall be treated by a suitable passivation process, for example by electropolishing or by treatment with 10 percent (v/v) nitric acid solution for not less than 30 min at a temperature not less than 10°C and not exceeding 60°C. The instruments shall then be rinsed in water and dried in hot air.

**Note** — If the joint is lubricated, the lubricant should be non-corrosive and suitable for medical application according to the Indian Pharmacopoeia.

## 7. Tests

7.1 *Performance Test* — The pliers shall be tested as given in 7.1.1 and 7.1.2.

7.1.1 A piece of 1 mm diameter mild steel wire shall be placed across the jaws of the pliers along the groove and protruding over the edge of the jaws at either end. With normal pressure of one hand, the wire shall be easily cut. This shall be done 6 times. The pliers shall show no sign of damage on completion of the test.

7.1.2 The pliers shall be made to bite on a piece of 1 mm diameter brass wire with light pressure whilst being rotated by hand. Similarly, the serrated jaw tips shall be pulled along the wire 6 times for 75 mm. On completion of the test, the wire shall be very slightly roughened.

7.2 *Rigidity Test* — The pliers shall be made to grip a piece of mild steel, 5 mm thick, by the tips of the jaws. A compressive force of 225 N (22.5 kgf approximately) shall be applied to the pliers and allowed to act for 2 minutes in such a manner that the force acts on each handle [a total of 450 N (45 kgf approximately)] at a distance of 40 mm from its free end. This shall be done 6 times. On completion of the test, the pliers shall show no sign of damage.

7.3 *Corrosion Resistance Test* — The pliers shall be tested in accordance with IS : 7531-1975 'Method for boiling and autoclaving test for corrosion resistance of stainless steel surgical instruments'. The pliers shall show no sign of corrosion after the test.

## 8. Marking and Packing

8.1 The pliers shall be legibly and indelibly marked with the manufacturer's name, initials or recognized trade-mark; the words 'Stainless Steel'; and the country of manufacture.

8.2 Each instrument shall be put in a polyethylene bag or wrapped in wax paper. The instruments shall then be packed in cartons in accordance with the current trade practice.

8.2.1 Alternatively, the instruments may be packed as agreed to between the purchaser and the supplier.

8.3 The packages shall be marked with the name of the instrument; the manufacturer's name, initials or recognized trade-mark; the words 'Stainless Steel'; and the country of manufacture.

8.4 *ISI Certification Marking* — Details available with the Indian Standards Institution.

9. *Sampling* — Sampling procedure and acceptance criteria for the pliers shall be as agreed to between the purchaser and the supplier. A recommended scheme for the same is given in Appendix A.

## APPENDIX A

( Clause 9 )

### SAMPLING SCHEME AND CRITERIA FOR CONFORMITY FOR PLIERS, PIN-ROUGHENING AND BENDING, DENTAL

A-1. Lot — In any consignment, all the pliers produced from the same material under similar conditions and having same surface finish shall constitute a lot.

A-2. The number of pliers to be selected from each lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 1.

TABLE 1 SCALE OF SAMPLING

( Clauses A-2, A-3.1 and A-3.2 )

Lot Size	Sample Size	Sub-Sample Size
(1)	(2)	(3)
Up to 15	2	1
16 to 50	3	1
51 to 150	5	2
151 and above	8	3

A-2.1 These pliers shall be selected from the lot at random and in order to ensure randomness of selection, procedures given in IS : 4905-1968 'Methods for random sampling' may be followed.

#### A-3. Number of Tests and Criteria for Conformity

A-3.1 All the pliers selected at random in accordance with col 1 and 2 of Table 1 shall be examined for shape and dimensions, workmanship, and surface condition ( visual ). None of the instruments in the sample shall fail to meet these requirements if the lot is to be accepted under this clause.

A-3.2 A sub-sample of size given in col 3 of Table 1 shall be selected at random from the pliers drawn as in A-2. The instruments in the sub-sample shall be subjected to hardness, performance, rigidity and corrosion resistance tests. No failure shall occur in any of these tests if the lot is to be accepted under this clause.

## EXPLANATORY NOTE

This standard was first issued in 1970. In this revision, tolerances on various dimensions have been specified, a recommended scheme of sampling has been added and the clauses on surface condition have been modified besides incorporating certain other modifications.